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TRANSMITTER AND RECEIVER: ACK AND I

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## Patents

Patents 111 - 120 on TRANSMITTER AND RECEIVER: ACK AND NACK. (0.05 seconds)

Did you mean: [TRANSMITTER AND RECEIVE: ACK AND NECK](#)

### Transmitter, receiver, and coding scheme to increase data rate and decrease bit error rate of an ...

US Pat. 6851086 - Filed Mar 30, 2001

If an **ACK** is received the appropriate packet manager 262 is signaled to clear its buffer and enter the idle state. If an **NACK** is received, the appropriate ...

### Random access control method for CDMA system

US Pat. 7133387 - Filed Apr 11, 2001 - NEC Corporation

**Transmitter/receiver** of base station 1 in the base station 45 is provided ...

Code generation unit 15 generates **ACK** signal or **NACK** signal on the basis of ...

### Formation of rekey messages in a communication system

US Pat. 5164986 - Filed Feb 27, 1991 - Motorola, Inc.

A **transmitter** 217 and **receiver** 219 modulate and demodulate data, respectively, ... The KMC then checks for reception of an **ACK** or **NACK** at step 419. ...

### Method and system for a data transmission in a communication system

US Pat. 7050405 - Filed Dec 6, 2002 - Qualcomm Incorporated

The reverse link packet error rate is determined in accordance with **ACK/NACK** of the reverse link packets. The value of A is increased by a first determined ...

### Method and protocol to support contention-free intervals and QoS in a CSMA network

US Pat. 6907044 - Filed Aug 4, 2000 - Intellon Corporation

The "partial ARQ" allows a **transmitter** to know that at least one station ...

101 Frame response with **ACK/NACK/FAIL** (same as above) to be followed by ...

### Assuring sequence number availability in an adaptive hybrid-ARQ coding system

US Pat. 6519731 - Filed Oct 22, 1999 - Ericsson Inc.

If there is packet data residing within the retransmission buffer 120, control transfers to box 320 in which a determination is made whether an **ACK** or **NACK** ...

### Method and apparatus for time-based reception of transmissions in a wireless communication system

US Pat. 6839566 - Filed Aug 16, 2001 - QUALCOMM, Incorporated

At time t!4 the **receiver** receives the retransmitted segment, and sends an **ACK** at time t!5. The **transmitter** receives the **ACK** from time t!7 to 60 t!8. ...

### Method or communications system using a robust diversity combination

US Pat. 7136424 - Filed Jun 29, 2001 - Siemens Aktiengesellschaft

To identify the packet data units arriving at the **receiver**, the units are ...

(**ACK/ NACK**) by the receiving station MS from the transmitting station BS. ...

Advanced data link controller having a plurality of multi-bit status registers

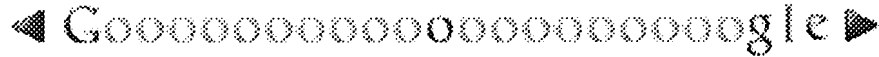
US Pat. 4368512 - Filed Mar 21, 1980 - Motorola, Inc.

The **receiver**, having acquired the block, checks for errors and then sends an **ACK** control character to the **transmitter** indicating that the block is correct ...

Method for eliminating a receiving data unit as a source of excessive resend requests

US Pat. 5636230 - Filed Jun 11, 1996 - Motorola, Inc.

-j^ preset invention can be more fully described with Upon reception of a **NACK**, the **transmitter** may resend the reference to FIGS. 1-. FIG. ...

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TRANSMITTER AND RECEIVER: ACK AND

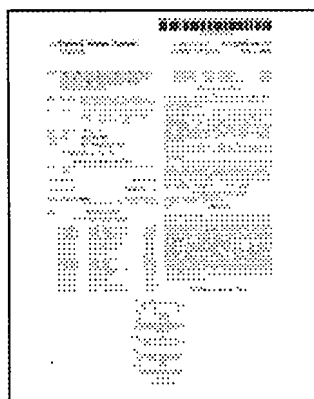
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# Transmitter, receiver, and coding scheme to increase data rate and decrease bit error rate of an ... Ted Szymanski

## Patent summary


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[Abstract](#) | [Drawing](#) | [Description](#) | [Claims](#)

### Abstract

Transmitters, receivers, and coding schemes to increase data rate and decrease bit error rate of an optical data link are disclosed. Data is transmitted across the link with a less than nominal bit error rate (BER), by encoding the data using a forward error correction (FEC) code or by requesting retransmission of transmitted packets in error. Data is transmitted at a speed that introduces errors at a rate that is in excess of the nominal BER but that may be corrected using the FEC code or retransmission so that the data may be received with less than the nominal BER. The data rate is increased as the link operating speed is increased beyond the overhead required by the FEC codes or retransmission. High speed FEC encoders and decoders facilitating such transmission are disclosed.

**Patent number:**

6851086

**Filing date:** Mar 30, 2001

**Issue date:** Feb 1, 2005

## Claims

What is claimed is:

1. A high-speed pipelined forward error correcting (FEC) encoder, for encoding  $k$  bit blocks of data into  $n$  bit blocks, each of said  $n$  bit blocks comprising one of said  $k$  bit blocks of data and  $(n-k)$  parity bits, said encoder comprising

$Q$  latches, wherein  $Q \geq 3$ ;

$Q-1$  combinational logic circuits, each of said combinational logic circuits interconnected between two of said latches, to receive an input of at least  $k$  bits from an upstream one of said latches, and provide an output of  $n$  bits to a downstream one of said latches, each output comprising  $(n-k)$  output bits representing said  $(n-k)$  parity bits in various stages of computation, each of said combinational logic circuits arranged to compute said  $(n-k)$  output bits in accordance with a defined generator polynomial, with said defined generator polynomial being identical for each of said combinational logic circuits.

2. The encoder of claim 1, wherein said defined generator polynomial is a generator polynomial for a cyclic code.

3. The encoder of claim 2, wherein said defined generator polynomial is a generator polynomial for a Reed-Solomon code.

4. The encoder of claim 1, wherein said defined generator polynomial generates one of a cyclic BCH code, or a cyclic Hamming code.

5. The encoder of claim 4, wherein said defined generator polynomial is a generator polynomial for one of a (7,4) Hamming code, a (15,11) Hamming code, a (15,7,2) Hamming code, a (15,7,2) BCH code, a (15,5,3) BCH code, a (31,16) BCH code, a (31,11) BCH code, a (23,12) Golay code.

6. The encoder of claim 1, wherein said FEC code is one of a (15,7), (15,5), (31,16), (63,48), (63,51), (63,45), (63,42), (63,37), (63,13), (127,113), (127,99), (127,106), and (127,64) majority-logic decodable cyclic FEC code.

7. A method of encoding  $k$  bit blocks of data into  $n$  bit blocks, each of said  $n$  bit blocks comprising one of said  $k$  bit blocks of data and  $(n-k)$  parity bits, said

**Inventor:** Ted  
Szymanski  
**Primary Examiner:**  
David Ton

**Current U.S.  
Classification**  
714/781; 714/786

**International  
Classification**  
H03M 1300

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### Search within this patent

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### Citations

Patent Number	Title	Issue date
<u>4486739</u>	Byte oriented DC balanced (0,4) 8B/10B partitioned block transmission code	Dec 4, 1984
<u>4777635</u>	Reed-Solomon code encoder and syndrome generator circuit	Oct 11, 1988
<u>5068854</u>	Error detection for fiber distributed interfaced optic link	Nov 26, 1991
<u>5383204</u>	Parallel encoding apparatus and method implementing cyclic redundancy check and Reed-Solomon codes	Jan 17, 1995
<u>5432630</u>	Optical bus with optical transceiver modules and method of manufacture	Jul 11, 1995
<u>5524218</u>	Dedicated point to point fiber	Jun 4, 1996

	optic interface	
<u>5579426</u>	Fiber image guide based bit-parallel computer interconnect	Nov 26, 1996
<u>5581566</u>	High-performance parallel interface to synchronous optical network gateway	Dec 3, 1996
<u>5606725</u>	Broadband network having an upstream power transmission level that is dynamically adjusted as a function of the bit error rate	Feb 25, 1997
<u>5754563</u>	Byte-parallel system for implementing reed-solomon error-correcting codes	May 19, 1998
<u>5943361</u>	System and method for generating signal waveforms in a CDMA cellular telephone system	Aug 24, 1999
<u>6031644</u>	Method, device, and system for controlling wavelength of optical signal	Feb 29, 2000
<u>6058499</u>	Error correcting method and device	May 2, 2000
<u>6070074</u>	Method for enhancing the performance of a regenerative satellite communications system	May 30, 2000
<u>6148423</u>	Signal transmission performance	Nov 14, 2000

optimization  
device in a  
system for  
transmitting  
digital data,  
especially on an  
optical link

6438723

Method and  
arrangement for  
the reliable  
transmission of  
packet data

Aug 20, 2002

6507927

Method and  
device for  
estimating the  
reliability of a  
decoded  
symbol  
sequence

Jan 14, 2003

6683855

Forward error  
correction for  
high speed  
optical  
transmission  
systems

Jan 27, 2004

#### Referenced by

**Patent Number**

**Title**

**Issue date**

6956642

Error  
function  
analysis of  
optical  
components

Oct 18, 2005

7007223

Efficient  
method and  
apparatus for  
low latency  
forward error  
correction

Feb 28, 2006

7020567

System and  
method of  
measuring a  
signal  
propagation  
delay

Mar 28, 2006

7187435

Error  
function  
analysis of  
optical  
components

Mar 6, 2007

## EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	6974928	ack or acknowledge or nack or no acknowledge	US-PGPUB; USPAT; USOCR	OR	OFF	2007/07/16 10:10
S2	3101710	S1 and transmit\$3 near multipl\$3 or pluralit\$3 adj packet or block or data	US-PGPUB; USPAT; USOCR	OR	ON	2007/07/16 10:12
S3	1100390	S2 and multiple or plural near3 path	US-PGPUB; USPAT; USOCR	OR	ON	2007/07/16 10:16
S4	207587	S3 and receiver	US-PGPUB; USPAT; USOCR	OR	ON	2007/07/16 10:40
S5	56537	S4 and network	USPAT	OR	OFF	2007/07/16 10:58
S6	43	S5 and repeater adj transceiver	USPAT	OR	OFF	2007/07/16 11:05
S7	6974928	ack or acknowledge or nack or no acknowledge	US-PGPUB; USPAT; USOCR	OR	OFF	2007/07/16 11:03
S8	3101710	S7 and transmit\$3 near multipl\$3 or pluralit\$3 adj packet or block or data	US-PGPUB; USPAT; USOCR	OR	ON	2007/07/16 11:03
S9	1100390	S8 and multiple or plural near3 path	US-PGPUB; USPAT; USOCR	OR	ON	2007/07/16 11:06
S10	207587	S9 and receiver	US-PGPUB; USPAT; USOCR	OR	ON	2007/07/16 11:06
S11	56537	S10 and network	USPAT	OR	OFF	2007/07/16 11:06
S12	43	S11 and repeater adj transceiver	USPAT	OR	OFF	2007/07/16 11:06
S13	43	S11 and repeater adj transceiver	USPAT	OR	OFF	2007/07/16 11:09